



AMENDMENT

Kindly amend the application as follows:


In the Claims:

RECEIVED
JUN - 3 2003
TECHNOLOGY CENTER

1. [currently amended] An ion source including a cathode, an anode, a longitudinal axis extending generally between said anode and said cathode, an ionisation region between said cathode and said anode, gas introducing means for introducing an ionisable gas into said ionisation region, means for creating a potential difference between said cathode and said anode to produce a flow of electrons from said cathode toward said anode, said electron flow passing substantially through said ionisation region and causing ionisation of said gas, means for concentrating said electron flow to create a region within said ionisation region and along said longitudinal axis where the electron flux is maximum, and ion expelling means for acting to expel ions created in said ionisation region from said ion source, wherein said gas introducing means includes at least one aperture that is disposed substantially adjacent to said longitudinal axis such that said ionisable gas is introduced into said ionisation region at a localised area in proximity to said region of maximum electron flux.

2. [original] An ion source according to claim 1 wherein said ion expelling means includes means for creating a magnetic field, said magnetic field acting to influence the direction in which said ions are expelled from said ion source.

3. [original] An ion source according to claim 1 further including means for creating a magnetic field, said magnetic field having a longitudinal axis substantially parallel with an axis of an electric field created by said potential difference between said cathode and said anode, and wherein said maximum electron flux substantially coincides with a maximum of the magnetic field intensity such that said magnetic field forms at least part of said means for concentrating said electron flow.



4. [currently amended] An ion source according to claim 3 wherein said anode has an annular surface substantially centered about said longitudinal axis, and wherein said longitudinal axis is annular having an axis is in substantial alignment with said magnetic field axis.

5. [currently amended] An ion source according to claim 4 wherein said gas introducing means includes a gas flow path terminating at an outlet member, said outlet member being disposed on or near said longitudinal ~~anode~~ axis and substantially adjacent said ionisation region.

6. [original] An ion source according to claim 5 wherein said outlet member is electrically conductive and is maintained at substantially the same potential as the anode.

7. [original] An ion source according to claim 6 wherein said outlet member is integral with said anode.

8. [original] An ion source according to claim 5 wherein said anode includes an internal fluid channel in communication with a fluid conduit supplying fluid to cool said anode.

9. [original] An ion source according to claim 8 wherein said fluid channel extends into said outlet member.

10. [original] An ion source according to claim 5 wherein said anode is mounted on a base of electrically insulating material, said base including a channel forming a part of said gas flow path.

11. [original] An ion source according to claim 4 wherein said anode, said cathode and said ionisation region are substantially surrounded by an electrically conductive shield maintained substantially at earth potential.

12. [original] An ion source according to claim 4 wherein said anode includes at least one surface exposed to said ionisation region, at least a portion of said at least one surface being of an electrically conductive non oxidising material.

13. [original] An ion source according to claim 12 wherein said electrically conductive nonoxidising material is Titanium Nitride.

14. [original] An ion source including a cathode, an anode, an ionisation region between said cathode and said anode, means for introducing an ionisable gas into said ionisation


region, means for creating a potential difference between said cathode and said anode to produce a flow of electrons from said cathode toward said anode, said electron flow passing substantially through said ionisation region and causing ionisation of said gas, and means acting to expel ions created in said ionisation region from said ion source, wherein said anode has at least one surface exposed to said ionisation region, at least a portion of said at least one exposed surface being of an electrically conductive nonoxidising material.

15. [original] An ion source according to claim 14 wherein said at least one exposed surface is a layer of Titanium Nitride coated onto said anode.

16. [original] An ion source according to claim 14 wherein said anode is annular and includes an inner surface sloping outwards in the direction of said cathode, said inner surface being exposed to said ionisation region and at least a portion of said inner surface being of electrically conductive non oxidising material.

17. [original] An ion source according to claim 16 wherein substantially the entire inner surface of said anode is of an electrically conductive non oxidising material.

18. [original] An ion source according to claim 16 wherein said gas introducing means includes ^man outlet member disposed substantially at the centre of said anode, said outlet member having a surface of electrically conductive non oxidising material.



19. (new) An ion source including a cathode, an anode, an ionisation region between said cathode and said anode, gas introducing means for introducing an ionisable gas into said ionisation region, means for creating a potential difference between said cathode and said anode to produce a flow of electrons from said cathode toward said anode, said electron flow passing substantially through said ionisation region and causing ionisation of said gas, and ion expelling means acting to expel ions created in said ionisation region from said ion source, wherein said gas introducing means includes a gas line terminating in an electrically conductive outlet member disposed within the ionisation region, said outlet member having one or more apertures therein providing communication of gas from the gas line to the ionisation region, and wherein said outlet member provides at least a portion of said anode.

20. (new) An ion source according to claim 19 wherein the outlet member is disposed substantially at the centre of the anode.

21. (new) An ion source according to claim 19 wherein the outlet member protrudes into the ionisation region.

22. (new) An ion source according to claim 19 wherein the or each of said apertures introduce gas into the ionisation region at a localised area.